HIGH SCHOOL ENTRANCE EXAMINATION BOARD

DEPARTMENTAL EXAMINATIONS, 1938

GRADE IX

GENERAL SCIENCE AND HEALTH EDUCATION

Time—2 hours.

Note: You have two hours for this paper. Section "A" is on Health. Section "B" is on General Science. Be sure to do as much as you can of both "A" and "B".

In *Section "A"* do questions 1 to 11 in this booklet; and questions 12 to 14 on foolscap.

In *Section "B"* do questions 15 to 47 in this booklet; and questions 48 to 61 on foolscap.

Work quickly on the questions which you can answer by writing in this booklet. Take your time with the questions which you answer by writing on foolscap.

When you finish at the close of two hours, put this booklet and the foolscap containing your answers in the envelope.

SECTION A

Answer questions 1 to 11 in this booklet; and questions 12, 13, and 14 on foolscap.

In the small square at the right place the letter (*a*, *b*, *c*, etc.) which will indicate what you consider to be the best answer. Notice that in Question 2 and some other questions the *two* "Best Answers" are required.

Values

1 **1.** Chlorine is used in a city water system to: ☐
(*a*) improve taste
(*b*) give a pleasant odor
(*c*) prevent oxidation in the water pipes
(*d*) kill harmful bacteria
(*e*) kill flies

2 **2.** We should eat some raw food each day for two reasons: ☐ ☐
(*a*) to keep gardeners employed
(*b*) to provide roughage
(*c*) to exercise our jaws
(*d*) to provide vitamins and minerals
(*e*) to save stove fuel

2 **3.** Food authorities advise against eating too much sugar because: ☐ ☐
(*a*) it is difficult to digest
(*b*) it tends to produce excessive acid in the system
(*c*) it is deficient in minerals and vitamins
(*d*) it is too heat producing
(*e*) it leads to excessive thirst

2 **4.** Diseased tonsils are likely to cause— ☐ ☐
(*a*) heart trouble
(*b*) stuttering
(*c*) myopia
(*d*) rheumatism
(*e*) stunted growth
(*f*) scurvy.

Values

1 **5.** Mastoid is usually the result of—

(*a*) common cold
(*b*) an infected tooth
(*c*) typhoid fever
(*d*) deafness
(*e*) foreign bodies in the ear.

☐

2 **6.** Put an x beside each of the *four* best things to do to check a severe nose bleed.

...... sit upright on a chair
...... slap chest three times
...... give cold water
...... chew gum
...... put ice on head
...... put head between knees
...... slap back three times
...... press side of nose that is bleeding
...... press on upper lip
...... keep very quiet.

1 **7.** The excessive use of alcohol affects most seriously the tissues of the:

(*a*) liver and kidneys
(*b*) eye muscles
(*c*) brain
(*d*) stomach
(*e*) bones

☐

1 **8.** Meat is graded to:

(*a*) improve its appearance
(*b*) standardize the quality
(*c*) provide employment
(*d*) regulate prices
(*e*) prevent spread of disease

☐

8 **9.** Match each item of the left hand column with the correct one of the right hand column. For example: "Florence Nightingale" will match with "nursing", so "e" is placed after "3" e.g. 3 — *e*.

1. diabetes	*a.* disease of adolescence	1
2. tuberculosis	*b.* more motor accidents	2
3. Nightingale	*c.* ease and grace of movement	3 — *e*
4. small-pox prevention	*d.* Banting	4
5. adequate sleep	*e.* nursing	5
6. careful disposal of sewage and garbage	*f.* growth and repair of tissues	6
7. alcohol	*g.* fresh foods to all parts of the world	7
8. athletics	*h.* vaccination and inoculation	8
9. modern railway and steamship refrigeration	*i.* fewer flies	9

Values

1 **10.** Regulations governing quarantine for contagious diseases are made by the following authority:

....

3 **11.** State *three* ways in which water meets the internal needs of the body:

....

....

....

....

....

N. B. Answer questions 12, 13 and 14 on foolscap.

2 **12.** What first aid would you render for a small child who had swallowed a quantity of iodine.

3 **13.** Write a list of *three* desirable mental habits which affect health.

3 **14.** Name *three* precautions that should be taken in dispensing drinking water in a rural school.

SECTION B

Answer questions 15 to 39 in this booklet.

1 **15.** Common resistances to work are:
(*a*) momentum
(*b*) inertia
(*c*) oil and bearings
(*d*) potential energy
(*e*) molecular motion.
☐

1 **16.** Sound travels in ordinary air:
(*a*) about 1,100 feet per second
(*b*) about 3 miles per second
(*c*) 186,324 feet per second
(*d*) 186,324 miles per second
(*e*) faster than in water
☐

1 **17.** A camp-fire burning is a clear example of—
(*a*) instantaneous combustion
(*b*) rapid oxidation
(*c*) slow oxidation
(*d*) organic decay
(*e*) conduction of heat.
☐

1 **18.** The days in winter are colder because of —
(*a*) the snow
(*b*) the frost
(*c*) the slant of the sun's rays
(*d*) humidity
(*e*) Boyle's Law.
☐

[OVER]

Values

3 **19.** There are *three* types of heat distribution. Indicate them.
(*a*) friction
(*b*) radiation
(*c*) capillarity
(*d*) osmosis
(*e*) photosynthesis
(*f*) vacuum
(*g*) inertia
(*h*) conduction
(*i*) ether waves
(*j*) Pascal's principle
(*k*) static
(*l*) convection
(*m*) inclined plane
(*n*) percussion
(*o*) thermometer

☐
☐
☐

1 **20.** An electric motor changes:
(*a*) radiant energy to force
(*b*) the strength of an electric current
(*c*) matter to non-matter
(*d*) vitamins to calories
(*e*) electrical energy to mechanical energy.

☐

1 **21.** Rain water, if collected in a non-metal dish in open air, may be used for a car or radio battery, because it—
(*a*) is soft
(*b*) is cheap
(*c*) is easy on the hands
(*d*) contains no dissolved minerals
(*e*) has oxygen dissolved in it.

☐

1 **22.** Nickel-chromium alloy is used in many electrical heat appliances because it does not unite with:
(*a*) carbon-dioxide
(*b*) nitrogen
(*c*) oxygen
(*d*) water vapour
(*e*) electricity

☐

1 **23.** A substance gets hot when it—
(*a*) conducts electricity readily
(*b*) conducts electricity poorly
(*c*) offers complete resistance to the electric current.

☐

1 **24.** The freezing point of water on a Centigrade thermometer is:

(*a*) 32° (*b*) -32° (*c*) 0° (*d*) 100° (*e*) 212°

☐

1 **25.** The relative humidity most favourable to health is:

(*a*) 10 – 20% (*c*) 50 – 60% (*e*) 100 – 110%
(*b*) 30 – 40% (*d*) 90 – 100%

☐

1 **26.** The high polish inside a thermos bottle is intended to:
(*a*) make cleaning easier
(*b*) keep out the cold
(*c*) prevent radiation of heat
(*d*) absorb heat.

☐

1 **27.** The heat from a match flame is due to:
(*a*) percussion
(*b*) friction
(*c*) chemical action
(*d*) compression

☐

Values

1 **28.** Light is a form of:
(*a*) matter (*b*) work (*c*) energy (*d*) electricity (*e*) oxidation ☐

1 **29.** The speed of light is approximately.
(*a*) 1,089 ft. per sec.
(*b*) 186,324 miles per second
(*c*) 186,000 ft. per second
(*d*) 4.27 light years
(*e*) 93,000,000 miles per second ☐

1 **30.** In the dark the pupil of the cat's eye is:
(*a*) luminous
(*b*) absent
(*c*) of the same size as in daylight
(*d*) larger than in daylight
(*e*) smaller than in daylight ☐

1 **31.** You see your image in the mirror because light is:
(*a*) refracted (*b*) reflected (*c*) rotated (*d*) diffused (*e*) absorbed. ☐

1 **32.** There are holes in the base of the kerosene lamp burner to:
(*a*) keep the chimney cool
(*b*) admit oxygen
(*c*) let out carbon-dioxide
(*d*) change oil to gas
(*e*) allow for expansion. ☐

2 **33.** Organic substances are distinguished from inorganic because the organic—
(*a*) have a pungent odor
(*b*) are light
(*c*) will char when heated
(*d*) have distinctive colors
(*e*) are from living tissues. ☐ ☐

1 **34.** Galileo's contributions to science were:
(*a*) inventing how to print good books on science
(*b*) proving that the earth goes around the sun
(*c*) showing that all heavy objects fall equally quickly
(*d*) building the tower of Pisa
(*e*) discovering Boyle's Law. ☐ ☐

1 **35.** In a water-tank partially filled with water, the pressure per square inch at the bottom of the tank depends upon:
(*a*) the volume of the tank
(*b*) the diameter of the tank
(*c*) the height of the tank above the ground
(*d*) the depth of water in the tank
(*e*) the weight of the water in the tank. ☐

1 **36.** Solid impurities can be removed from water by:
(*a*) aeration (*b*) alum (*c*) washing soda (*d*) adding distilled water (*e*) artificial light. ☐

1 **37.** Work, as defined in science, is done when—
(*a*) a man pushes against a stone wall
(*b*) a car is held motionless by its brakes
(*c*) a boy throws a baseball
(*d*) iron rusts
(*e*) an electric current produces light in a blub. ☐

[OVER]

Values

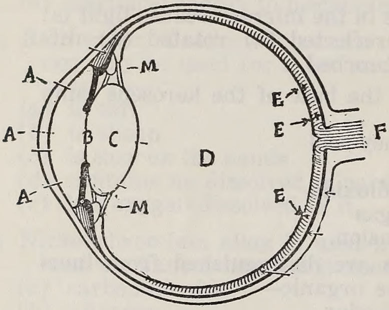
1 **38.** Water is a good cleaning agent chiefly because:
- (*a*) it boils at 100 C.
- (*b*) it is non-corrosive
- (*c*) it is a good solvent
- (*d*) it contains hydrogen
- (*e*) it evaporates slowly.

☐

1 **39.** Wood shavings are often used in the attic of a house as insulation because:
- (*a*) they are light in weight
- (*b*) they retard convection currents
- (*c*) their slow oxidation produces heat
- (*d*) they are rarely attacked by insects.

☐

3 **40.** In this diagram of an eye,



(*a*) the transparent part of the sclerotic coat marked A is called the ....

(*b*) the opening marked B is called ....

(*c*) incoming light is refracted by the part marked ....

(*d*) the image is formed on the part marked .... which is called the ....

(*e*) the function of the ciliary muscles marked M is ....

4 **41.** Selecting *any four* pairs other than the example given, match the names on the left hand side with the correct words in the right hand column. Use the squares below. For example, Florence Nightingale matches with nursing and is written

| 12 | and | e |

1. Wright Brothers
2. Pasteur
3. Archimedes
4. Burbank
5. Saunders
6. Mendel
7. Franklin
8. Maxwell
9. Torricelli
10. Darwin
11. de Kruif
12. Florence Nightingale

- (*a*) atmospheric pressure causes water to rise in a lift-pump.
- (*b*) a body in water is buoyed up with the force of the water displaced
- (*c*) many changes in vegetables and flowers
- (*d*) electro-magnetic waves
- (*e*) nursing
- (*f*) early interest in electricity in U.S.A.
- (*g*) hydrophobia
- (*h*) aeroplane
- (*i*) Marquis wheat
- (*j*) "Hunger Fighters" or "Microbe Hunters"
- (*k*) variations that indicate evolution in animals
- (*l*) important laws of heredity

☐ and ☐ ☐ and ☐ ☐ and ☐ ☐ and ☐

Values

4 **42.** Put an x in the space to the left of each word you think represents "matter":

...... rock
...... honor
...... energy
...... soil
...... heat
...... a fish
...... patriotism
...... courage
...... sound
...... water
...... light
...... steel
...... oxygen
...... electricity
...... air
...... a rose

5 **43.** Write p to the left for *physical change*; and c to the left for *chemical change*:

...... you have a tooth pulled
...... gaseous wax burns on a candle
...... carbon combines with oxygen in the body
...... water is filtered
...... acid in a battery acts on lead to make an electrical current
...... water turns into ice
...... acid acts on marble chips
...... dry air becomes moist
...... an old horse-shoe rusts
...... clothes are blued in laundering

4 **44.** Arrange, in order, from the primitive to the most modern, the following devices used in house lighting (Use letters only).

(*a*) closed oil dish with wick
(*b*) lamp with chimney
(*c*) open oil dish
(*d*) fish-tail gas jet
(*e*) closed oil dish
(*f*) carbon filament
(*g*) tungsten filament
(*h*) a torch or reed-light

Primitive ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ Most Modern

45. Write the names of *two* common tools or parts of machines which clearly apply the principle of each of the following:

1 Centrifugal force (*a*) ....
(*b*) ....

1 Pulley (*a*) ....
(*b*) ....

1 Inclined plane (*a*) ....
(*b*) ....

1 Wheel and Axle (*a*) ....
(*b*) ....

1 Wedge (*a*) ....
(*b*) ....

1 Screw (*a*) ....
(*b*) ....

46. Write in the right-hand margin whether the statements are *true* or *false*. If false, put a circle around the words which are incorrect, and *write the correct word, or words, in the right-hand margin.*

2 (*a*) Men at the bottom of a caisson feel about the same pressure as if they were at the same depth below the surface of the water. ....
....

2 (*b*) During the first down stroke of the piston of a lift pump the upper valve is forced open by the partial vacuum between the valves. ....
....

2 (*c*) When a fine needle is carefully laid upon the surface of water, it floats because of capillarity. ....
....

[OVER]

Values

8 **47.** What is each of the following, and in what plant or animal does it occur

stoma		
lenticels		
gills		
roots		
lungs		
cilia		
spiracles		
lung-sacs		

Answer the following questions on foolscap.

6 **48.** Describe an experiment to show oxidation. Draw and label diagrams.

4 **49.** Draw and label an air-pump for compressing air.

4 **50.** A horizontal bar AB is 12 ft. long. The end B is supported. A weight of 120 pounds is suspended from it at C two feet from B. What lift is required at the end A to support the weight?

4 **51.** Draw a diagram to illustrate the convection currents around a bonfire on a calm evening.

3 **52.** Give *one* example of each of the *three* classes of lever.

4 **53.** What is the chief difference between an ordinary gas engine and a Diesel engine?

6 **54.** Tell how to make a mercury barometer. Explain how it works.

4 **55.** What is meant by the "carbon cycle" or the "nitrogen cycle"?

2 **56.** You are given two samples of water, one soft and the other hard. How would you distinguish one from the other?

5 **57.** Fully explain photosynthesis.

7 **58.** Define: theory, law, opinion, fact, superstition, experiment, hypothesis.

6 **59.** Show how each of *three* different plants, and *three* different animals is adapted to its environment.

3 **60.** Draw and label the parts of a candle flame.

2 **61.** What is the unit used in measuring the illumination of a lamp? Name the chief advantages of indirect lighting.

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